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Simulations of Interacting Magnetic Micro-swimmers ERIC KEAVENY, MARTIN MAXEY, Division of Applied Mathematics, Brown University — Following a recent realization of artificial micro-swimming (Dreyfus et. al., *Nature*, **437**, 862-865), we conduct simulations of a swimmer whose mechanism of propulsion is the magnetically driven undulation of a flagellum-like tail composed of chemically linked paramagnetic beads. In our model, the tail is treated as a series of spheres tied together by inextensible, bendable links. The spheres interact magnetically through mutual dipole interactions, and hydrodynamic interactions are achieved by the force-coupling method. Building on our previous results, we examine the interactions between multiple swimmers employing a flagellum beating strategy as well as those using a rotary propulsion scheme. In addition to swimmer-swimmer interactions, the effects of a nearby surface on the behavior of a micro-swimmer will be discussed.

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